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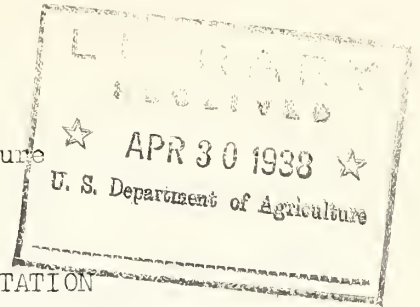
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Forest Service

APPALACHIAN FOREST EXPERIMENT STATION

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## THE APPALACHIAN FOREST FIRE DANGER METER

By

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With the development of better fire control practices in the East, it has become evident that greater efficiency can be attained by a field organization if the leaders know when to increase forces and when a lesser organization can safely carry the fire load. Financially sound fire control policies will not permit a maximum degree of preparedness at all times but rather demand an organization of fluctuating strength, varying to meet the changes of fire danger.

The judgment of rangers and dispatchers has been relied upon in the past to determine what type of organization can most efficiently handle the probable fire situation from day to day. The vagaries of fire-weather and the complexity of the relations among the several variables, however, make difficult an accurate rating of fire danger by observation for even the most experienced men.

Experience has proved that measurements of the important fire danger variables and their proper integration must largely supplant estimates if the best fire control is to be attained. This has resulted in the development of several schemes for measuring fire danger, the first of which was devised by Gisborne for northern Idaho and western Montana in 1931.

The Appalachian Forest Experiment Station, in cooperation with Forest Service fire control officers, has developed a fire danger meter for use in the southern mountain region by which the most important factors of fire danger are integrated and the resultant expressed on a numerical scale of 1 (no danger) to 5 (extreme danger). The five danger classes are defined in general terms that indicate the usual type of fire control organization justifiable for each class.

The Appalachian danger meter integrates fuel dryness, as indicated by amount of rain, elapsed time since rain, and current relative humidity; current wind velocity; season of the year; and visibility distance. The latter factor affects organization only when danger is rated in the higher brackets; that is, when poor visibility and conditions conducive to rapid spread of fire are coincident. Such a situation, of course, necessitates a more intensive detection force if fires are to be discovered while small.



The fire danger meter not only provides an excellent check on the judgment of a ranger or dispatcher from day to day, but is of value in several other ways. The numerical ratings provided can be added and averaged into concrete expressions of severity of a month, season, or year. Such terms, indicating severity of the conditions encountered by field forces, permit reasonable ratings of efficiency of control organizations. Statistics of number of fires, area burned, and cost have greatest significance when compared to numerical danger ratings. Fire danger measurement is one essential for a sound plan of financing fire control. The needs of different units can be determined only after a comparative study of the normal danger on each area.

A network of fire-weather stations is necessary for the accurate rating of fire danger. The stations should be of such a number and distribution as to sample major variations in forest type, elevation, and aspect. Precipitation, relative humidity, wind velocity, and visibility (at a few lookout stations only), measured several times a day and reported to the dispatcher, enable him to take full cognizance of fire danger.

At present, 55 such stations are in operation on eight National Forests in the southern Appalachian Mountains.

